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09/874,661

06/04/2001

Michael J. Wengler

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02/16/2005

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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 09/874,661 | Applicant(s) WENGLER, MICHAEL J. | |
| | Examiner Kevin M. Burd | Art Unit 2631 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. This office action, in response to the amendment filed 11/26/2004, is a final office action.

Response to Arguments

2. The previous objection to claim 14 and the drawings are withdrawn. The Drawings are approved by the examiner.
3. Applicant's arguments filed 11/26/2004 have been fully considered but they are not persuasive regarding claims 32-37 and 39. Applicant argues the controller is configured to determine the spatial signature, including amplitude and phase, for each signal. This limitation is not found in these claims. The previous rejections of claims 32-37 and 39 are maintained.
4. Applicant's arguments with respect to claims 1-31 and 38 have been considered but are moot in view of the new grounds of rejection. Zhang discloses a receiver comprising a controller that includes a timing controller 20 and an adaptive antenna array controller 22 in figure 1. "The timing controller 20 includes M complex data buffers (one complex data buffer for each of the M antenna branches) with a timing pointer that points to the beginning of an current OFDM or training symbol and that is controlled by the phase locked loop controller 32 (PLL), enabling a precise symbol by symbol output of the timing controller 20. Using methods known in the art, the phase locked loop controller 32 checks the timing error and makes a proper adjustment on the timing controller 20 (timing pointer)." (column 4, lines 18-28). This shows the phase of each

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signal in each antenna branch is known. The amplitude is adjusted by using the weights in the adaptive antenna array controller 22 (column 5, lines 15-25). Therefore, Zhang discloses determining a “spatial signature” including the amplitude and phase for each signal.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-6, 9, 18-23, 26 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang (US 6,369,758).

Regarding claims 1, 3-6, 18, 20-23, and 38, Zhang discloses a receiver comprising a multi-element antenna (figure 1) configured to receive signals from at least one transmitter and to output highly correlated signals from the transmitters. The signals will be “highly correlated” because the antennas are located at some distance apart and this distance will provide a correlation between the signals. This correlation value is a “highly correlated” value. A controller is configured to receive the signals and combine the signals to reproduce the selected signal (column 4, lines 6-18). The controller

includes a timing controller 20 and an adaptive antenna array controller 22 as shown in figure 1. "The timing controller 20 includes M complex data buffers (one complex data buffer for each of the M antenna branches) with a timing pointer that points to the beginning of an current OFDM or training symbol and that is controlled by the phase locked loop controller 32 (PLL), enabling a precise symbol by symbol output of the timing controller 20. Using methods known in the art, the phase locked loop controller 32 checks the timing error and makes a proper adjustment on the timing controller 20 (timing pointer)." (column 4, lines 18-28). This shows the phase of each signal in each antenna branch is known. The amplitude is adjusted by using the weights in the adaptive antenna array controller 22 (column 5, lines 15-25). Therefore, Zhang discloses determining a "spatial signature" including the amplitude and phase for each signal.

Regarding claims 2 and 19, the array in figure 1 contains 2 to M antennas.

Regarding claims 9 and 26, Zhang discloses the receiver can be used in non-OFDM systems (column 18, lines 14-17) such as CDMA.

6. Claims 32-34, 36, 37 and 39 are rejected under 35 U.S.C. 102(a) as being anticipated by Maruta et al (US 6,205,166).

Regarding claims 32, 37 and 39, Maruta discloses a CDMA receiver and a method of using a CDMA receiver comprising a multi-element antenna (figure 1) configured to receive signals from at least one transmitter and to output highly correlated signals (column 3, lines 1-4) from the transmitters. A controller is configured

to receive the signals and combine the signals to reproduce the selected signal (column 3, lines 46-50).

Regarding claims 33, figure 1 shows the number of antennas can be from 2 to N.

Regarding claim 34, Maruta discloses the antennas are spaced such a distance apart that their output signals are correlated with each other. Such a distance is called a "correlation distance". (column 3, lines 1-4).

Regarding claim 36, Maruta discloses the channels are maximum-ratio combined in adder 8 (column 3, lines 46-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,369,758) further in view of Richard (US 5,901,174).

Regarding claims 7 and 24, Zhang discloses the system stated above in paragraph 5. Zhang does not disclose the signals are combined using an optimal combiner. Richard discloses receiving signals via multiple channels and using an optimal combiner. This maximizes the signal to noise ratio and minimizes error signals (column 8, lines 7-10). For this reason, it would have been obvious for one of ordinary

skill in the art at the time of the invention to utilize the optimal combiner of Richard in the system and method of Zhang.

8. Claims 8, 10-17, 25, 27, 28, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,369,758) in view of Maruta et al (US 6,205,166)

Regarding claims 8 and 25, Zhang discloses a receiver stated above in paragraph 5. Zhang does not disclose the combiner is a maximal ratio combiner. Maruta discloses the channels are maximum-ratio combined in adder 8 (column 3, lines 46-50). This maximizes the desired signal amplitude and minimizes the error signals. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the maximum ratio combiner of Maruta in the receiver system of Zhang.

Regarding claims 10-12, 14, 27, 28 and 30, Zhang discloses a receiver comprising a multi-element antenna (figure 1) configured to receive signals from at least one transmitter and to output highly correlated signals from the transmitters. The signals will be "highly correlated" because the antennas are located at some distance apart and this distance will provide a correlation between the signals. This correlation value is a "highly correlated" value. A controller is configured to receive the signals and combine the signals to reproduce the selected signal (column 4, lines 6-18). The controller includes a timing controller 20 and an adaptive antenna array controller 22 as shown in figure 1. "The timing controller 20 includes M complex data buffers (one complex data buffer for each of the M antenna branches) with a timing pointer that points to the beginning of an current OFDM or training symbol and that is controlled by the phase

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locked loop controller 32 (PLL), enabling a precise symbol by symbol output of the timing controller 20. Using methods known in the art, the phase locked loop controller 32 checks the timing error and makes a proper adjustment on the timing controller 20 (timing pointer)." (column 4, lines 18-28). This shows the phase of each signal in each antenna branch is known. The amplitude is adjusted by using the weights in the adaptive antenna array controller 22 (column 5, lines 15-25). Therefore, Zhang discloses determining a "spatial signature" including the amplitude and phase for each signal.

Zhang does not disclose the combiner is a maximal ratio combiner. Maruta discloses the channels are maximum-ratio combined in adder 8 (column 3, lines 46-50). This maximizes the desired signal amplitude and minimizes the error signals. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the maximum ratio combiner of Maruta in the receiver system of Zhang.

Regarding claims 13, 15 and 16, figure 1 shows the received signals are separated into I and Q signals and these signals are weighted (column 4, lines 6-18). These signals are also demodulated (column 3, lines 62-66).

Regarding claims 17 and 31, Zhang discloses the receiver can be used in non-OFDM systems (column 18, lines 14-17) such as CDMA.

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,369,758) in view of Maruta et al (US 6,205,166) further in view of Richard (US 5,901,174).

Regarding claim 29, the combination of Zhang and Maruta discloses the system and method stated above in paragraph 8. The combination does not disclose the signals are combined using an optimal combiner. Richard discloses receiving signals via multiple channels and using an optimal combiner. This maximizes the signal to noise ratio and minimizes error signals (column 8, lines 7-10). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the optimal combiner of Richard in the receiver and method of the combination of Zhang and Maruta.

10. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maruta et al (US 6,205,166) in view of Richard (US 5,901,174).

Regarding claim 35, Maruta discloses the method stated above in paragraph 6. Maruta does not disclose the signals are combined using an optimal combiner. Richard discloses receiving signals via multiple channels and using an optimal combiner. This maximizes the signal to noise ratio and minimizes error signals (column 8, lines 7-10). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the optimal combiner of Richard in the receiver and method of Maruta.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Thursday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin M. Burd

2/11/2005

KEVIN BURD
PRIMARY EXAMINER